Innovative Service Around the Globe YAGEO

# DATA SHEET

## THYRISTOR SURGE SUPPRESSORS
## MODEMS/LINE CARD

P2300SD

**RoHS compliant & Halogen free**

Product specification– March 18, 2021 V.2

# Thyristor Surge Suppressors (TSS) Data Sheet

## Description

DO-214AA Thyristor solid state protection thyristor protect telecommunications equipment such as modems, line cards, fax machines, and other CPE.
It is used to enable equipment to meet various regulatory requirements including GR 1089, ITU K.20, K.21 and K.45, IEC 60950, UL 60950, and TIA-968(formerly known as FCC Part 68).

## Features

Compared to surge suppression using other technologies, This device offer absolute surge protection regardless of the surge current available and the rate of applied voltage (dv/dt).

- Cannot be damaged by voltage
- Eliminate hysteresis and heat dissipation typically found with clamping devices
- Eliminate voltage overshoot caused by fast-rising transients
- Are non-degenerative
- Will not fatigue
- Have low capacitance, making them ideal for high-speed transmission equipment
- Meets MSL level 1, per J-STD-020

## Electrical Parameters

| Parameter | Definition |
|---|---|
| $V_{DRM}$ | **Peak Off-state Voltage –** maximum voltage that can be applied while maintaining off state |
| $V_S$ | **Switching Voltage –** maximum voltage prior to switching to on state |
| $V_T$ | **On-state Voltage –** maximum voltage measured at rated on-state current |
| $I_{DRM}$ | **Leakage Current –** maximum peak off-state current measured at $V_{DRM}$ |
| $I_S$ | **Switching Current –** maximum current required to switch to on state |
| $I_T$ | **On-state Current –** maximum rated continuous on-state current |
| $I_H$ | **Holding Current –** typical current required to maintain on state |
| $C_O$ | **Off-state Capacitance –** typical capacitance measured in off state |
| $I_{PP}$ | **Peak Pulse Current –** maximum rated peak impulse current |

## Electrical Characteristics

| Part Number | $V_{DRM}$ (V) | $V_S$ (V) | $V_T$ (V) | $I_{DRM}$ (μA) | $I_S$ (mA) | $I_T$ (A) | $I_H$ (mA) | $C_O$ (pF) | $I_{PP}$ 10/1000μs (A) | $V_{PP}$ 10/700μs (V) | Marking Code |
|---|---|---|---|---|---|---|---|---|---|---|---|
| P2300SD | 190 | 260 | 4 | 5 | 800 | 2.2 | 50 | 100 | 200 | 8000 | P23D |

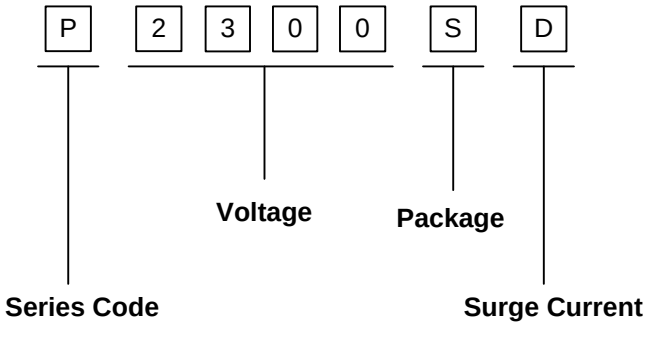
Notes:

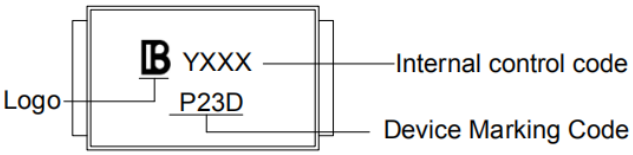
- All measurements are made at an ambient temperature of 25℃. $I_{PP}$ applies to -40℃ through +85℃ temperature range.
- Off-state capacitance($C_O$) is measured at 1 MHz with a 2V bias and is typical value.

## Thermal Considerations

| Package DO-214AA/SMB | Symbol | Parameter | Value | Unit |
|---|---|---|---|---|
|  | $T_J$ | Operating Junction Temperature | -40 to +125 | ℃ |
| | $T_S$ | Storage Temperature Range | -40 to +150 | ℃ |
| | $R_{\theta JA}$ | Junction to Ambient on printed circuit | 90 | ℃/W |

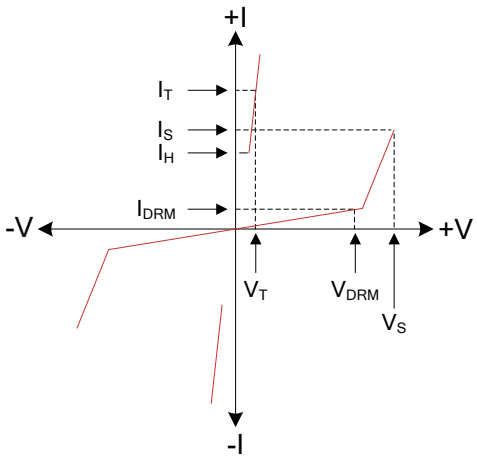
## Part Number Code and Marking



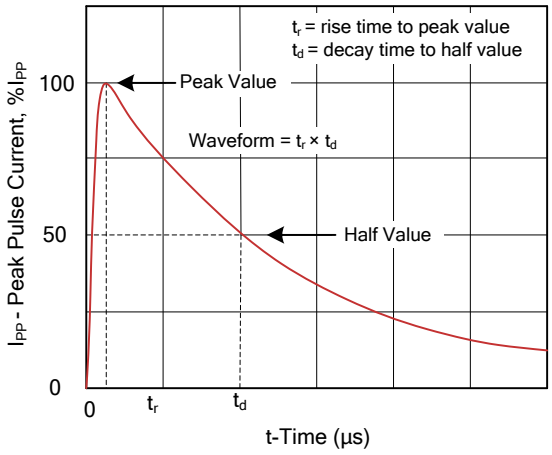



## Characteristics Curves

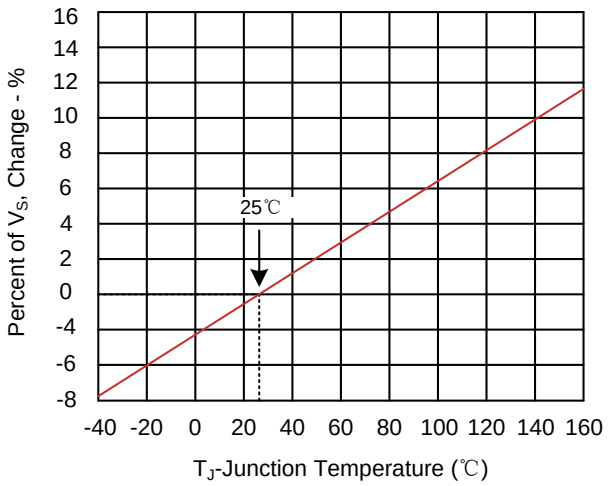
### Figure 1. V-I Characteristics



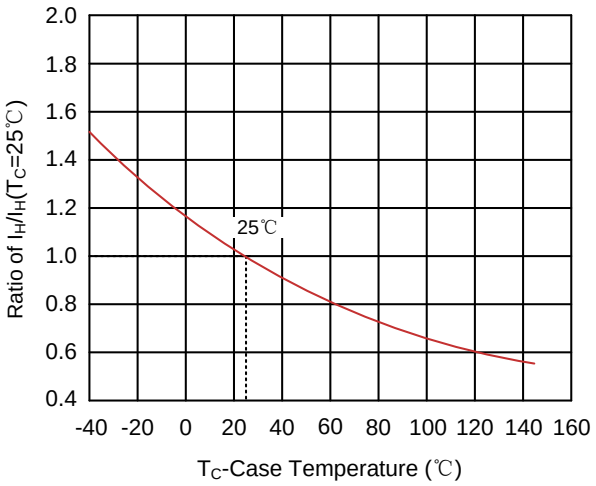

### Figure 2. tr × td Pulse Wave-form




### Figure 3. Normalized Vs Change versus Junction Temperature

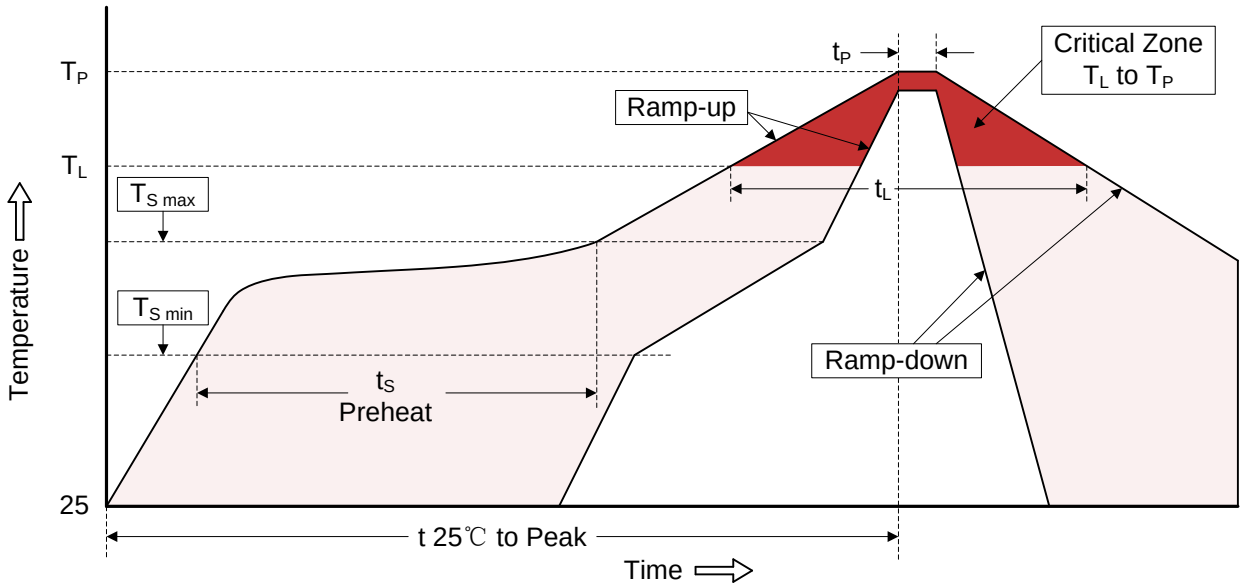



### Figure 4. Normalized DC Holding Current versus Case Temperature



## Recommended Soldering Conditions

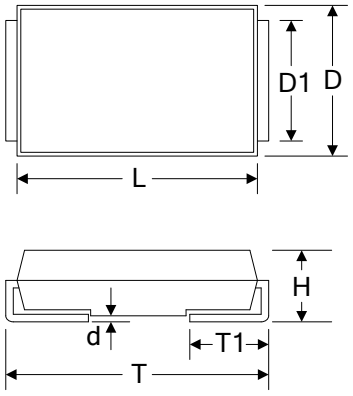
Reflow Soldering




Recommended Conditions

| Profile Feature | Pb-Free Assembly |
|---|---|
| Average ramp-up rate ($T_L$ to $T_P$) | 3℃/second max. |
| Preheat<br>-Temperature Min ($T_{S\ min}$)<br>-Temperature Max ($T_{S\ max}$)<br>-Time (min to max) ( $t_S$) | <br>150℃<br>200℃<br>60-180 seconds |
| $T_{S\ max}$ to $T_L$<br>-Ramp-up Rate | <br>3℃/second max. |
| Time maintained above:<br>-Temperature ($T_L$)<br>-Time ($t_L$) | <br>217℃<br>60-150 seconds |
| Peak Temperature ($T_P$) | 260℃ |
| Time within 5℃ of actual Peak Temperature ($t_P$) | 20-40 seconds |
| Ramp-down Rate | 6℃/second max. |
| Time 25℃ to Peak Temperature | 8 minutes max. |

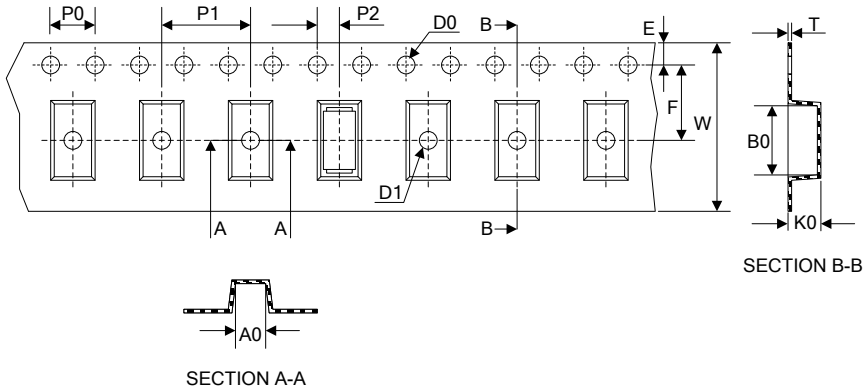
## Dimensions (SMB/DO-214AA)




| Symbol | Millimeters | | Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| L | 4.06 | 4.70 | 0.160 | 0.185 |
| D | 3.30 | 3.94 | 0.130 | 0.155 |
| D1 | 1.90 | 2.20 | 0.075 | 0.086 |
| T | 5.21 | 5.59 | 0.205 | 0.220 |
| T1 | 0.76 | 1.52 | 0.030 | 0.060 |
| d | - | 0.203 | - | 0.008 |
| H | 1.95 | 2.65 | 0.077 | 0.104 |

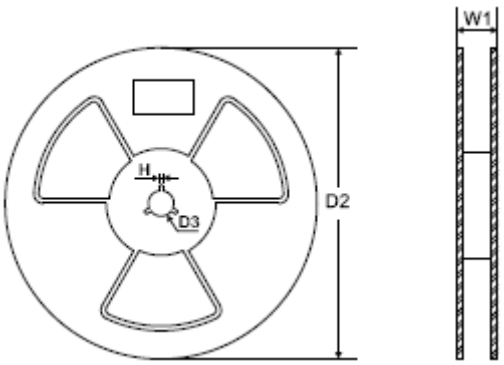
## Packaging

Tape




| Symbol | Dimension (mm) |
|---|---|
| W | 12.00±0.30 |
| P0 | 4.00±0.10 |
| P1 | 8.00±0.10 |
| P2 | 2.00±0.10 |
| D0 | Φ1.55±0.05 |
| D1 | Φ1.55±0.05 |
| E | 1.75±0.10 |
| F | 5.50±0.10 |
| A0 | 3.76±0.10 |
| B0 | 5.69±0.10 |
| K0 | 2.70±0.10 |
| T | 0.25±0.10 |

13〃 Reel




| | |
|---|---|
| D2 | Φ330.0±2.0 |
| D3 | Φ13.5±0.5 |
| H | 2.5±0.5 |
| W1 | 16.0±1.0 |

Quantity: 3000PCS

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